

CLAIMS:

1. A mask for transferring a lithographic pattern onto a substrate by use of a lithographic exposure apparatus, said mask comprising:
 - at least one non-critical feature, formed utilizing one of a low-transmission phase-shift mask and a non-phase-shifting mask, and
 - 5 at least one critical feature, formed utilizing a high-transmission phase-shift mask.
2. A mask according to claim 1, wherein said mask is formed on a single supporting plate.
3. A mask according to claim 1, wherein said low-transmission phase-shift mask comprises a 5-8% transmission attenuated phase-shift mask.
- 10 4. A mask according to claim 2, wherein said low-transmission phase-shift mask comprises a 5-8% transmission attenuated phase-shift mask.
5. A mask according to claim 1, wherein said low-transmission phase-shift mask comprises a non-phase-shifting chrome mask.
6. A mask according to claim 2, wherein said low-transmission phase-shift mask
- 15 comprises a non-phase-shifting chrome mask.
7. A mask according to claim 1, wherein said high-transmission phase-shift mask comprises at least a 10% transmission attenuated phase-shift mask.
8. A mask according to claim 2, wherein said high-transmission phase-shift mask comprises at least a 10% transmission attenuated phase-shift mask.
- 20 9. A mask according to claim 3, wherein said high-transmission phase-shift mask comprises at least a 10% transmission attenuated phase-shift mask.
10. A mask according to claim 5, wherein said high-transmission phase-shift mask comprises at least a 10% transmission attenuated phase-shift mask.
11. A mask according to claim 1, wherein said high-transmission phase-shift mask
- 25 comprises at least a 10% transmission chromeless phase-shift mask.
12. A mask according to claim 2, wherein said high-transmission phase-shift mask comprises at least a 10% transmission chromeless phase-shift mask.

13. A mask according to claim 3, wherein said high-transmission phase-shift mask comprises at least a 10% transmission chromeless phase-shift mask.

14. A mask according to claim 5, wherein said high-transmission phase-shift mask comprises at least a 10% transmission chromeless phase-shift mask.

5 15. A mask according to claim 1, wherein said mask comprises a plurality of said non-critical features and a plurality of said critical features.

16. A mask according to claim 3, wherein said mask comprises a plurality of said non-critical features and a plurality of said critical features.

17. A mask according to claim 5, wherein said mask comprises a plurality of said
10 non-critical features and a plurality of said critical features.

18. A mask according to claim 7, wherein said mask comprises a plurality of said non-critical features and a plurality of said critical features.

19. A method of forming a mask for transferring a lithographic pattern onto a substrate by use of a lithographic exposure apparatus, said method comprising the steps of:

15 forming at least one non-critical feature on said mask, said at least one non-critical feature being formed utilizing one of a low-transmission phase-shift mask and a non-phase-shifting mask, and

forming at least one critical feature on said mask, said at least one critical feature being formed utilizing a high-transmission phase-shift mask.

20 20. A method for transferring a lithographic pattern from a photolithography mask onto a substrate by use of a lithographic exposure apparatus, said method comprising the steps of:

forming said photolithography mask, said photolithography mask comprising at least one non-critical feature, said at least one non-critical feature being formed utilizing one of a low-
25 transmission phase-shift mask and a non-phase-shifting mask, and at least one critical feature, said at least one critical feature being formed utilizing a high-transmission phase-shift mask,

subjecting said photolithography mask to a single exposure utilizing said lithographic exposure apparatus, said single exposure operative for printing both said critical feature and said non-critical feature on said substrate.

30 21. A method according to claim 20, wherein said photolithography mask is a mask according to claim 2.

22. A method according to claim 20, wherein said photolithography mask is a mask according to claim 3.

23. A method according to claim 20, wherein said photolithography mask is a mask according to claim 5.

5 24. A method according to claim 20, wherein said photolithography mask is a mask according to claim 7.

25. A method for transferring a lithographic pattern from a photolithography mask onto a substrate by use of a lithographic exposure apparatus, said method comprising the steps of:

10 forming a first photolithography mask, said first photolithography mask comprising at least one non-critical feature, said at least one non-critical feature being formed utilizing one of a low-transmission phase-shift mask and a non-phase-shifting mask;

forming a second photolithography mask, said second photolithography mask comprising at least one critical feature, said at least one critical feature being formed utilizing a high-
15 transmission phase-shift mask,

subjecting said first photolithography mask to an exposure utilizing said lithographic exposure apparatus, and

subjecting said second photolithography mask to an exposure utilizing said lithographic exposure apparatus.

20 26. A method according to claim 25, wherein said low-transmission phase-shift mask comprises a 5-8% transmission attenuated phase-shift mask.

27. A method according to claim 25, wherein said low-transmission phase-shift mask comprises a non-phase-shifting chrome mask.

28. A method according to claim 25, wherein said high-transmission phase-shift mask
25 comprises at least a 10% transmission attenuated phase-shift mask.

29. A method according to claim 26, wherein said high-transmission phase-shift mask comprises at least a 10% transmission attenuated phase-shift mask.

30. A method according to claim 27, wherein said high-transmission phase-shift mask comprises at least a 10% transmission attenuated phase-shift mask.

30 31. A method according to claim 25, wherein said high-transmission phase-shift mask comprises at least a 10% transmission chromeless phase-shift mask.

32. A method according to claim 26, wherein said high-transmission phase-shift mask comprises at least a 10% transmission chromeless phase-shift mask.

33. A method according to claim 27, wherein said high-transmission phase-shift mask comprises at least a 10% transmission chromeless phase-shift mask.

5 34. A device manufacturing method comprising the steps of:

(a) providing a substrate that is at least partially covered by a layer of radiation-sensitive material;

(b) providing a projection beam of radiation using a radiation system;

(c) using a pattern on a mask to endow the projection beam with a pattern in its cross-section;

10 (d) projecting the patterned beam of radiation onto a target portion of the layer of radiation-sensitive material,

wherein, in step (c), use is made of a mask comprising:

at least one non-critical feature, formed utilizing one of a low-transmission phase-shift mask and a non-phase-shifting mask, and

15 at least one critical feature, formed utilizing a high-transmission phase-shift mask.

35. A device manufactured using a method according to claim 34.